will be clear to one skilled in the art from a reading of this disclosure that various changes in form and detail can be made without departing from the true scope of the invention. For example, all the techniques and apparatus described above can be used in various combinations. All publications, patents, patent applications, or other documents cited in this application are incorporated by reference in their entirety for all purposes to the same extent as if each individual publication, patent, patent application, or other document were individually indicated to be incorporated by reference for all purposes.

1. A method of performing thermal melt analysis of a nucleic acid in a microfluidic device, the method comprising:

providing a microfluidic device having at least one microfluidic channel, the at least one microfluidic channel having an upstream portion and a downstream portion,

introducing fluid comprising the nucleic acid and amplification reagents into the microfluidic channel so that the fluid flows from the upstream portion to the downstream portion of the channel,

cycling the temperature in the upstream portion so that the nucleic acid undergoes amplification,

subjecting the fluid to a series of temperatures in the downstream portion, wherein the series of temperatures includes a temperature high enough to cause denaturization of the nucleic acid, and

measuring a detectable property emanating from the fluid that is indicative of the extent of denaturation of the nucleic acid in the downstream portion.

2. The method of claim 1, wherein the nucleic acid is DNA.

3. The method of claim 1, wherein the step of introducing fluid into the microfluidic channel comprises introducing fluid through a pipettor extending from the microfluidic device.

4. The method of claim 1, wherein the fluid is induced to flow from the upstream portion to the downstream portion by means of a pressure differential applied to the microfluidic channel.

5. The method of claim 1, wherein the step of cycling the temperature in the upstream portion comprises controlling different region of the upstream portion to different temperatures, whereby the temperature of the fluid is cycled as the fluid flows through the different regions of the upstream portion.

6. The method of claim 5, wherein the step of controlling the different regions of the upstream portion to different temperatures comprises varying the cross section of the different regions and joule heating the upstream portion by passing an electric current through the fluid in the upstream portion, whereby the electric current heats the different regions to different temperatures.

7. The method of claim 5, wherein the step of controlling the different regions of the upstream portion to different temperatures comprises placing thermal blocks of different temperatures in thermal contact with the different regions of the upstream portion.

8. The method of claim 1, wherein the step of cycling the temperature comprises cycling the temperature of the entire upstream portion, whereby the number of temperature cycles the fluid is subjected to as it flows through the upstream portion is determined by the amount of time it takes the fluid to flow through the upstream portion.

9. The method of claim 8, wherein the cycling of the temperature of the entire upstream portion comprises varying an electric current used to joule heat the upstream portion.

10. The method of claim 8, wherein the cycling of the temperature of the entire upstream portion comprises varying the temperature of the upstream portion using a non-joule heating method.

11. The method of claim 10, wherein the non-joule heating method comprises placing the upstream portion in thermal contact with a thermal block, wherein the temperature is cycled by varying the temperature of the thermal block.

12. The method of claim 10, wherein the non-joule heating method comprises passing an electric current through resistive heating elements in thermal contact with the upstream portion, wherein the temperature is cycled by varying the current passing through the resistive heating elements.

13. The method of claim 12, wherein the resistive heating elements are fabricated onto a surface of the microfluidic device.

14. The method of claim 12, wherein the non joule heating method further comprises placing an energy sink in thermal contact with the upstream portion.

15. The method of claim 1, wherein the amplification comprises the use of PCR.

16. The method of claim 15, wherein the amplification reagents comprise primers, a thermostable polymerase, and nucleotides.

17. The method of claim 1, wherein the amplification comprises the use of LCR.

18. The method of claim 1, wherein the step of subjecting the fluid to a series of temperatures in the downstream portion comprises stopping the flow of fluid in the downstream portion, and varying the temperature of the stationary fluid contained within the downstream portion.

19. The method of claim 18, wherein varying the temperature of the fluid comprises continuously increasing the temperature of the fluid.

20. The method of claim 19, wherein the temperature of the fluid is continuously increased at a rate in the range of 0.1° C./second to 1° C./second.

21. The method of claim 19, wherein the temperature of the fluid is continuously increased at a rate in the range of 0.01° C./second to 0.1° C./second.

22. The method of claim 19, wherein the temperature of the fluid is continuously increased at a rate in the range of 1° C./second to 10° C./second.

23. The method of claim 19, wherein the temperature of the fluid is continuously increased using joule heating.

24. The method of claim 19, wherein the temperature of the fluid is continuously increased using non-joule heating.

25. The method of claim 24, wherein the non-joule heating comprises heating the downstream portion using a thermal block in thermal contact with the downstream portion.

26. The method of claim 1, wherein the detectable property comprises fluorescence.